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ABSTRACT

Information drawn from research conducted in a comparative study between middle and high school students is presented. The study was designed to investigate the difference in the analysis of absolute and relativistic generalizations. Data from this research indicate that differences do exist between middle and high school students in this area of absolute and relativistic thinking. In their reactions to absolute statements provided for analysis, high school students tended to show greater uncertainty in agreement than middle school students. On the relativistic statements, middle school students tended to show greater uncertainty than high school students. Middle school students, when confronted with both relativistic and absolute statements, show more uncertainty in agreement on the relativistic statements. As a result of these findings, implications are noted and recommendations are made which are intended to provide guidance for conducting instruction related to the enhancement of critical thinking skills in this area. (Author/JD)

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TEACHING FOR CRITICAL THINKING

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TEACHING FOR CRITICAL THINKING

A problem of significance which continually has faced serious-minded educators is that of helping students to become better thinkers and problem solvers. While the majority of students tend to be able to learn facts fairly readily, they seem to have much greater difficulty in comprehending the significance of these facts and applying this learned information to new situations. The authors earlier analyzed the relationship between the higher level thought processes of middle school and high school students in order to assist in the development of instructional strategies for improving critical thinking skills. In general, the results of this research supported the position that, as individuals increase in chronological age, their thinking patterns change qualitatively. A major finding of this earlier research dealt with the transition from concrete to more relativistic thinking. It was learned that middle school students, as compared to students at the high school level, are more likely to assume positions of agreement, or disagreement, to statements where strong, absolute terms (e.g., "always" and "never") are used. High School students, contrarily, tend to be more uncertain, or noncommittal, when presented with such absolute statements. When faced with such statements, high school students, apparently, become more situational or contextual in their analyses. Because of this, the observation is made that such students are more relativistic in the drawing of conclusions and of taking positions. This tendency for high school students to think in more relativistic terms when compared to younger students (who seemed unaffected by such absolutes) led the investigators to suggest that older students may engage in higher level intellectual analysis of the implications associated with such statements.

This earlier research, which focused on problems involving the analysis of historical events, left the investigators with two additional concerns to be addressed. First, could the earlier findings be replicated in a more controlled situation? Second, would the differences between the thinking patterns of middle school and high school students still exist when the problem situations to be analyzed represented dilemmas common to the everyday lives of adolescents? Basically, it was felt that middle school students may be less absolute in their thinking if the problems which they faced were more familiar to them (i.e., more concrete).

PURPOSE

This study was designed to determine if middle school students react differently than high school students to propositions stated in absolute or relativistic terms where the propositions posed for reaction represent proximately near rather than far propositions. Specifically, the study was designed to answer the following questions:

1. Do middle school students react with differing degrees of uncertainty to situations described in absolute terms than do high school students?

2. Do middle school students react with differing degrees of uncertainty to situations described in relativistic terms than do high school students?

PROCEDURE

Students involved in the study were selected from intact classes from two schools in a large southeastern school district. A total of one hundred and sixty-one students participated in the study. Ninety-two students constituted the high school sample and sixty-nine were from the middle school level. The instrument, Reactions to Social Situations Survey (Appendix B),

was developed to gather information for this investigation. The instrument is composed of two descriptions of events in the lives of hypothetical adolescent students. Each description (situation) is followed by ten position statements: five statements are stated in absolute terms and five are presented in a relativistic fashion. In responding to the instrument, students are asked to react to each statement by indicating whether they agree, disagree, or are uncertain about the statement. The instrument, then, presents a total of twenty items for which positions are to be taken. The situations and accompanying statements are as follows:

Situation 1: A brief description involving a student changing schools and his efforts at making friends and belonging to the group is presented.

Respondents are asked to react to the accompanying statements:

1. It might be true that rules sometimes should be broken in order to please our friends.
*2. It is always hard to make new friends.
*3. Schools must always have rules so students can learn.
4. If many people are breaking rules, then it is probably OK to bend them.
5. If a school has a rule you should probably try to follow it.
*6. Parents always know what is best for their children.
*7. It is never good to let your friends down.
8. If you are not hurting anyone, it might be OK to break a school rule.
9. It is sometimes best to follow the rules even when you don't agree with them.
*10. One should always follow the rules.

(* Absolute statements are indicated here by an asterisk)

Situation 2: A brief description of two students' reactions to not doing well in school and their reasons for their difficulties is presented.

Respondents are asked to react to the following statements:

*1. People have to try as hard as they can all the time.
*2. Teachers care about all of their students.

3. Students sometimes fail because their friends are bad influences.
4. It is sometimes necessary to do things that you don't want to do.
*5. Hard work always pays off.
6. People usually are interested in helping others.
*7. Friends should always be able to count on each other.
8. Sometimes we blame others when we should blame ourselves.
9. At times, fun and work are the same thing.
*10. A student should always try to do what the teacher says.

(* Absolute statements are indicated here by an asterisk)

As a measure of internal consistency reliability, the results for both high school students and middle school students on the first half of the instrument were correlated with the results of the second portion for each. Due to the length of the instrument, the obtained correlations were adjusted through the use of the Spearman Brown Prophecy formula. The adjusted reliabilities are .80 and .68 for the high school and middle school samples respectively.

RESULTS

The collected data were analyzed using Chi-Square. Differences at the $p < .05$ level of probability were considered to be significant. Of the twenty items, statistical differences between the middle school and high school students were found on eight (See Tables I and Ia - Appendix A). An asterisk after the number of the item indicates that a significant difference was found between middle school student and high school student responses to that item.

High school and middle school students were also compared on their responses to the ten absolute statements combined and the ten relativistic statements combined. These results are displayed in Table Two (Appendix A).

The ten absolute statements also were combined and compared with the ten relativistic statements combined for each of the two groups. These

comparisons are presented in Table Three (Appendix A).

CONCLUSIONS

The original questions which served as the foundation for investigation in this research were directed toward the question of uncertainty in reference to both absolute and relativistic terminology. Data from this research indicate that differences do exist between middle school and high school students in this area of reactions to absolute and relativistic thinking as identified in the following conclusions:

1. On the ten absolute statements provided, high school students tended to show greater uncertainty than middle school students. Notably, on the statistically significant items, high school students were more uncertain on three of the four.

2. On the ten relativistic statements provided, middle school students tended to show greater uncertainty than high school students. Specifically, all four of the relativistic items indicated this tendency.

3. Middle school students, when confronted with both relativistic and absolute statements, show more uncertainty on the relativistic statements. Whereas, high school students tend to show the opposite behavior. This is, they are more uncertain on absolute statements.

IMPLICATIONS

While research data on adolescents has, historically, been most widely represented in the physical development area, research on intellectual growth has continued to mount over the past decade. Even as educators have more frequently and recently explored intellectual development there remains, obviously, much yet to be learned. Nevertheless, conclusions have and must be drawn in an effort to assist the classroom teacher to better serve the development of the thinking process in the adolescent learner.

The findings presented here offer a number of clear implications for classroom instruction. These implications are predicated on the fact that a major responsibility of the classroom teacher is to prepare the student for, however variously defined, the society and culture which the student will face after the end of the formal schooling years. With this in mind, it follows that it is the responsibility of the teacher to investigate those numerous areas which, in the controlled and guided environment of the classroom, can closely approximate this away-from-the-school setting.

For those teachers teaching in the middle school, some important messages come from these findings. When working with middle school students, it is important to maintain a certain amount of caution in offering situations to students as being absolutes. This is particularly the case as middle school students have a tendency, beyond that seen in students at the high school level, to accept and agree with statements posed in this manner. Middle school students may be thought of as being more impressionable than high school students as they are more quick to agree with absolute statements which are offered to them. While this note of caution is considered important, it is also the case that middle school students will be confronted with such statements in the "real world" outside of the classroom and will need to be able to analyze such statements for their true merit.

Because of this, it is recommended that teachers of middle school students build into their teaching repertoire the use of both absolute and relativistic statements for the purpose of student critique and analysis. Guided through this, students can develop the ability to observe statements offered in absolute terms and to analyze them for their credibility. Staying away from the use of such statements will by no means enhance the development

of this ability and using such statements without caution or indiscriminately will force unnecessary and sometimes inappropriate conclusions. Basically, whether the teaching strategy chosen is lecture, questioning, or inquiry, middle school students will need greater teacher direction and guidance than high school students to break down information and review it for what it truly represents.

Important implications may also be drawn for those teachers working at the high school level. While high school students appear to engage in more detailed relativistic thinking than do middle school students by way of their increased uncertainty or disagreement with absolute statements, their analyses of such situations can still and should achieve greater sophistication through instruction. The possibility exists that high school students either are uncertain or disagree with such statements as they encounter them simply by having developed a frame of mind that "nothing" can always be true. Whether this may be the case or not, such conclusions should not be drawn from the use of a mere blanket rule such as this. For this reason alone, teachers should continue to involve students in the analysis of such statements and, as appropriate, offer different perspectives and viewpoints for critique. In the end, if, following the investigation of differing positions and views, such statements are still rejected or students are still uncertain, students will have reached this position through a higher level of intellectual activity rather than through simply employing an adopted rule for reaction and application. Such a rule, applied without true review and investigation, can lead to undue doubt and cynicism. This, clearly, is not the desired end result of education.

Whether at the middle or high school level, a review of these findings

and implications brings to focus a number of primary concerns for the classroom teacher. First, the teacher has as a major objective to establish a positive climate for analysis and investigation. This climate setting must strive for the establishment of a non-threatening, open, and inquiry-oriented atmosphere. Students will not openly analyze and expose their deeper thinking commitments in an environment where they feel that they personally are being questioned. Second, the teacher has the responsibility of seeking out and utilizing those instructional approaches which address analysis, synthesis, and evaluation. Instruction which involves perspective, viewpoint, debate, controlled contradiction and, in general, the guided development of cognitive dissonance, will lead to a deeper thought process in the learner. It is this type of thought process which encompasses the essence of critical thinking.

APPENDIX A

TABLE I

ANALYSIS OF STUDENT RESPONSES BY SITUATION AND CATEGORY

SITUATION I

Statements		Disagree (%)	Uncertain (%)	Agree (%)	Chi-Square	Probability
1.	M.S.	39.13	31.88	28.99	5.779	.0556
	H.S.	58.24	20.88	20.88		
2.	M.S.	31.88	11.59	56.52	2.773	.2499
	H.S	44.57	10.87	44.57		
3.	M.S.	10.14	11.59	78.26	1.001	.6062
	H.S.	15.38	12.09	72.53		
*4.	M.S.	62.32	26.09	11.59	5.968	.0506
	H.S.	73.03	11.24	15.73		
5.	M.S.	10.14	4.35	85.51	1.767	.4134
	H.S.	8.79	9.89	81.32		
*6.	M.S.	41.18	20.59	38.24	9.852	.0073
	H.S.	59.34	24.18	16.48		
*7.	M.S.	36.23	26.09	37.68	6.771	.0339
	H.S.	56.67	20.00	23.33		
8.	M.S.	44.93	23.19	31.88	.421	.8103
	H.S.	44.57	27.17	28.26		
9.	M.S.	2.90	8.70	88.41	1.660	.4361
	H.S.	6.52	11.96	81.52		
*10.	M.S.	17.91	19.40	62.69	16.439	.0003
	H.S.	35.87	33.70	30.43		

(*Items where significant differences were found are indicated here by an asterisk)

TABLE Ia

ANALYSIS OF STUDENT RESPONSES BY SITUATION AND CATEGORY

SITUATION II

Statements		Disagree (%)	Uncertain (%)	Agree (%)	Chi-Square	Probability
1.	M.S.	25.00	10.29	64.71	1.856	.3954
	H.S.	16.30	11.96	71.74		
*2.	M.S.	31.34	22.39	46.47	20.140	.0001
	H.S.	46.74	39.13	14.13		
*3.	M.S.	29.41	27.94	42.65	9.789	.0075
	H.S.	17.39	15.22	67.39		
4.	M.S.	10.29	10.29	79.41	5.666	.0588
	H.S.	6.67	2.22	91.11		
5.	M.S.	37.31	10.45	52.24	5.796	.0551
	H.S.	22.83	21.74	55.43		
6.	M.S.	20.90	35.82	43.28	1.084	.5817
	H.S.	17.58	30.77	51.65		
7.	M.S.	7.46	8.96	83.58	.227	.8708
	H.S.	5.49	9.89	84.62		
*8.	M.S.	4.48	14.93	80.60	12.508	.0019
	H.S.	2.17	1.09	96.74		
*9.	M.S.	19.12	27.94	52.94	6.495	.0389
	H.S.	14.13	14.13	71.74		
10.	M.S.	11.94	13.43	74.63	.847	.6547
	H.S.	13.04	18.48	68.48		

(*Items where significant differences were found are indicated here by an asterisk)

TABLE II

ANALYSIS OF STUDENT RESPONSES
BY STATEMENT TYPE

Absolute Statements	Disagree (%)	Uncertain (%)	Agree (%)	Chi-Square	Probability
M.S.	170 (25)	105 (16)	403 (59)	19.53	<.01
H.S.	289 (32)	185 (20)	441 (48)		
Relativistic Statements					
M.S.	167 (25)	144 (21)	372 (54)	12.68	<.01
H.S.	226 (25)	132 (14)	554 (61)		

TABLE III

ANALYSIS OF COMBINED STATEMENTS

	Disagree (%)	Uncertain (%)	Agree(%)	Chi-Square	Probability
Middle School Students					
Absolute Statements	170 (25)	105 (16)	403 (59)	7.3	<.05
Relative Statements	167 (25)	144 (21)	372 (54)		
High School Students					
Absolute Statements	289 (32)	185 (20)	441 (48)	28.76	<.001
Relative Statements	226 (25)	132 (15)	554 (60)		

APPENDIX B

REACTIONS TO SOCIAL SITUATIONS SURVEY

INSTRUCTIONS

The following pages contain two descriptions of events in the lives of people much like you. Each is called a situation. Read each of the situations provided. After reading each situation and the accompanying statements, go to the response sheet and mark your reaction to the statements. Remember, you should answer the questions in response to the situation you just read. There are ten statements for each situation. Place all of your answers on the response sheet. There are no right or wrong answers in this activity. Only your views are requested.

by

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SITUATION I

It was early October and Bill had been in Brook-King School for a little over 7 weeks. Moving from one community to another was really tough. Bill's previous school, located in another state, was something that he longed for. At least, he longed for his friends who were still there.

Making new friends was surely a difficult thing to do. Bill moved from class to class and from teacher to teacher each period. Although he didn't stay with the same group of students all day long, there were a few students who did move with him to the same classes. David, Jerry, Tim, and Howard were in four classes with Bill. Bill felt that he would like to be in their group but, as yet, the opportunity hadn't come up for them to do anything together other than go to the same classes. They seemed to be a popular group and many of the other students looked to them as being "important" people.

On one particular day at lunch, however, David mentioned to Bill that they were going to stay after school in the recreation area and play some basketball. He wondered if Bill would like to join them. Immediately, Bill thought of three things. First, this was the very thing that he had wanted to have happen for a long, long time. Second, he thought of his parents' rule to go home directly after school. Being new to the community, they didn't want Bill to wander around on his own with them not knowing where he was. Finally, Bill remembered Mr. Jefferson's rule that students should leave the school grounds once school was out. Mr. Jefferson was the principal of Brook-King School. He had had a number of situations arise where property had been damaged in the recreation area after school hours and, to avoid this, had decided to simply close the grounds and declare them off-limits after school.

Bill couldn't believe the many thoughts swimming through his head. He told David about his parents' rule and about his concern over Mr. Jefferson. David said that even though the rule had been made, it was seldom enforced. They "always" played after school in the recreation area. Sometimes they got caught and were put out and sometimes they weren't. Maybe no one would be watching them today, he hoped. David said that he thought that Mr. Jefferson's rule was a silly one anyway and that they had every right to play in the recreation area whenever they wished.

For Bill, the decision was a very rough one to make. In the end, though, his desire to belong in the group won out. He stayed and played ball. His friends seemed to know what they were doing.

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Please respond to the statements listed below as they relate to Situation I. Place all of your responses on the answer sheet provided. Make only one response for each statement. You are being asked to identify whether you agree, disagree or are uncertain.

1. It might be true that rules sometimes should be broken in order to please our friends.
2. It is always hard to make new friends.
3. Schools must always have rules so students can learn.
4. If many people are breaking rules, then it is probably OK to bend them.
5. If a school has a rule you should probably try to follow it.
6. Parents always know what is best for their children.
7. It is never good to let your friends down.
8. If you are not hurting anyone, it might be OK to break a school rule.
9. It is sometimes best to follow the rules even when you don't agree with them.
10. One should always follow the rules.

SITUATION II

David and Marty sat next to each other in the last row of Mr. Robert's 4th period pre-algebra class. David and Marty were buddies. For them, life was fun, school was fun, seeing friends was fun, almost everything was fun. Except, of course, studying for classes, doing homework, and taking tests.

To David and Marty, this was another one of those frightful Fridays. Mr. Roberts was passing back the tests that they had taken earlier in the week. They both had come to expect that their grades would never be the best in the world. It did bother them, however, that they didn't seem to be able to ever make the kind of grades in pre-algebra that their parents wanted them to make. They had talked many times about how hard their textbook was. The problems were too difficult and confusing to understand. Every time they decided to study, which really wasn't too often, they generally gave up because they couldn't figure out the explanations to the problems in their book. Oh, Mr. Roberts said that if they were having problems that they should come in and see him after school. They were pretty sure, though, that he really didn't want them to. He didn't care all that much. After all, hadn't he done the teaching of the lessons that they couldn't understand, and hadn't he picked the textbook that was so confusing and difficult? Besides, after school was "their" time, not Mr. Roberts'.

As David and Marty got their papers, they had guessed correctly. David's 64 and Marty's 58 were two of the lowest grades in the class. Even though they were prepared for it, both David and Marty were angry. Hadn't they tried? Hadn't they studied? They knew that pre-algebra wasn't all that hard. Mr. Roberts was just too hard to understand. He didn't explain things clearly. And that bookobody could understand it. They had even studied together for an hour last Monday evening before Tuesday's test. If they had had the time they would have studied even more. They both knew, though, that when you are up against a teacher as tough as Mr. Roberts, and assignments as difficult as the ones that he gives, there really wasn't much point in studying a great deal. Boyow they would have to show their parents another poor grade. At least they would understand. Surely they had had teachers that were as "hard" as Mr. Roberts.

****

Please respond to the statements listed below as they relate to Situation II. Place all of your responses on the answer sheet provided. Make only one response for each statement. You are being asked to identify whether you agree, disagree or are uncertain.

1. People have to try as hard as they can all the time.
2. Teachers care about all of their students.
3. Students sometimes fail because their friends are bad influences.
4. It is sometimes necessary to do things that you don't want to do.
5. Hard work always pays off.
6. People usually are interested in helping others.
7. Friends should always be able to count on each other.
8. Sometimes we blame others when we should blame ourselves.
9. At times, fun and work are the same thing.
10. A student should always try to do what the teacher says.